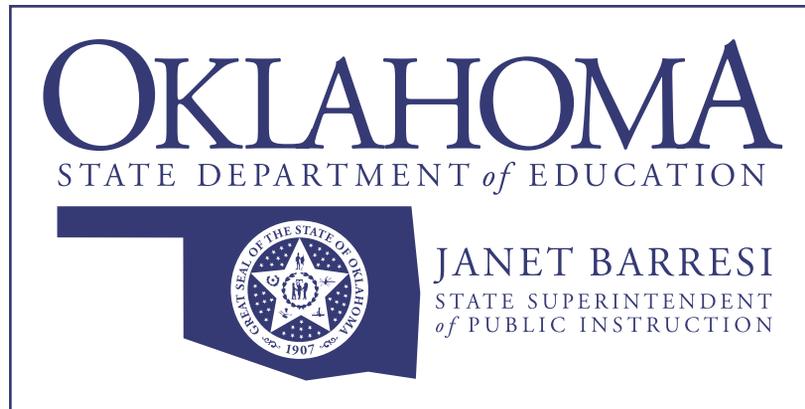


Oklahoma School Testing Program



Oklahoma Core Curriculum Tests

2011–2012 Released Items

End-of-Instruction
Biology I

Oklahoma State Department of Education
Oklahoma City, Oklahoma

PEARSON

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Section 1

Section 1

Directions

Read each question and choose the best answer.

- 1 During a procedure to extract DNA from an onion, a student uses a solution of cold 95% ethanol. Section 3 of the Material Safety Data Sheet is shown.

Section 3. Hazards Identification

Emergency Overview WARNING!

FLAMMABLE LIQUID AND VAPOR.

MAY CAUSE EYE IRRITATION.

MAY CAUSE RESPIRATORY TRACT IRRITATION.

If swallowed, may cause headaches, dizziness, drowsiness and nausea, and may lead to unconsciousness.

Do not ingest. Avoid contact with skin and clothing.

Do not breathe vapor or mist. Keep container closed.

Use with adequate ventilation.

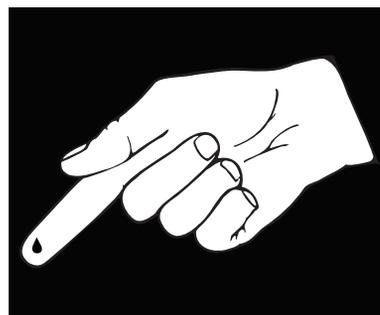
Wash thoroughly after handling.

Which safety symbol is associated with the use of 95% ethanol?

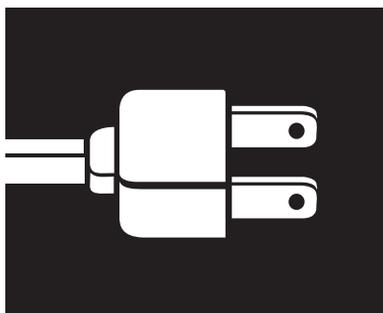
A



B



C



D



2 The tips of chromosomes are composed of structures called telomeres. Telomeres shorten each time a cell divides. When the telomeres are shortened to a set length, further cell division stops in most types of cells. Scientists inserted a gene that produces the enzyme telomerase into normal skin and retinal eye cells. This enzyme stops the shortening of telomeres during cell division. They found that these cells continued to divide for 20 generations longer than skin and retinal eye cells without the inserted gene.

The scientists hope to use their research to develop treatments for disorders such as skin diseases and retinal deterioration. What question should they answer first before using such treatments?

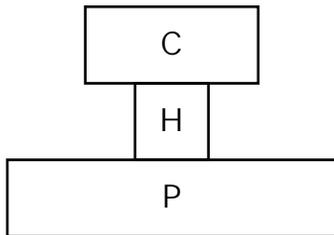
- F** Does inserting a telomerase gene in a skin cell allow it to divide more times?
- G** Do telomeres normally get shorter in retinal eye cells each time they divide?
- H** Does inserting a telomerase gene in a retinal eye cell increase the risk of a cell mutation?
- J** Do telomeres that are shortened through cell division to a set length stop further cell division?

Section 1

- 3 Jacob thinks that most of the available energy in ecosystems is stored in the tissues of consumers.

Which of these energy pyramids supports Jacob's hypothesis?

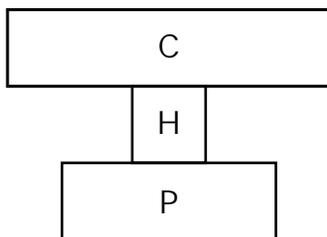
A



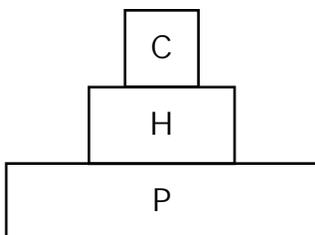
Key

C = Carnivore
H = Herbivore
P = Producer

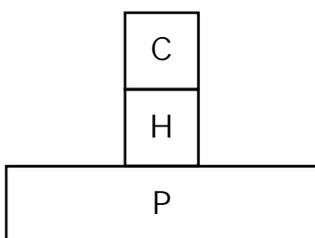
B



C



D



4 Victor knows that matter cycles through ecosystems. He hypothesizes that the nitrogen in the air should also become part of a plant. To test this hypothesis, he writes an experimental design using a pea plant. These steps are found in his experimental design.

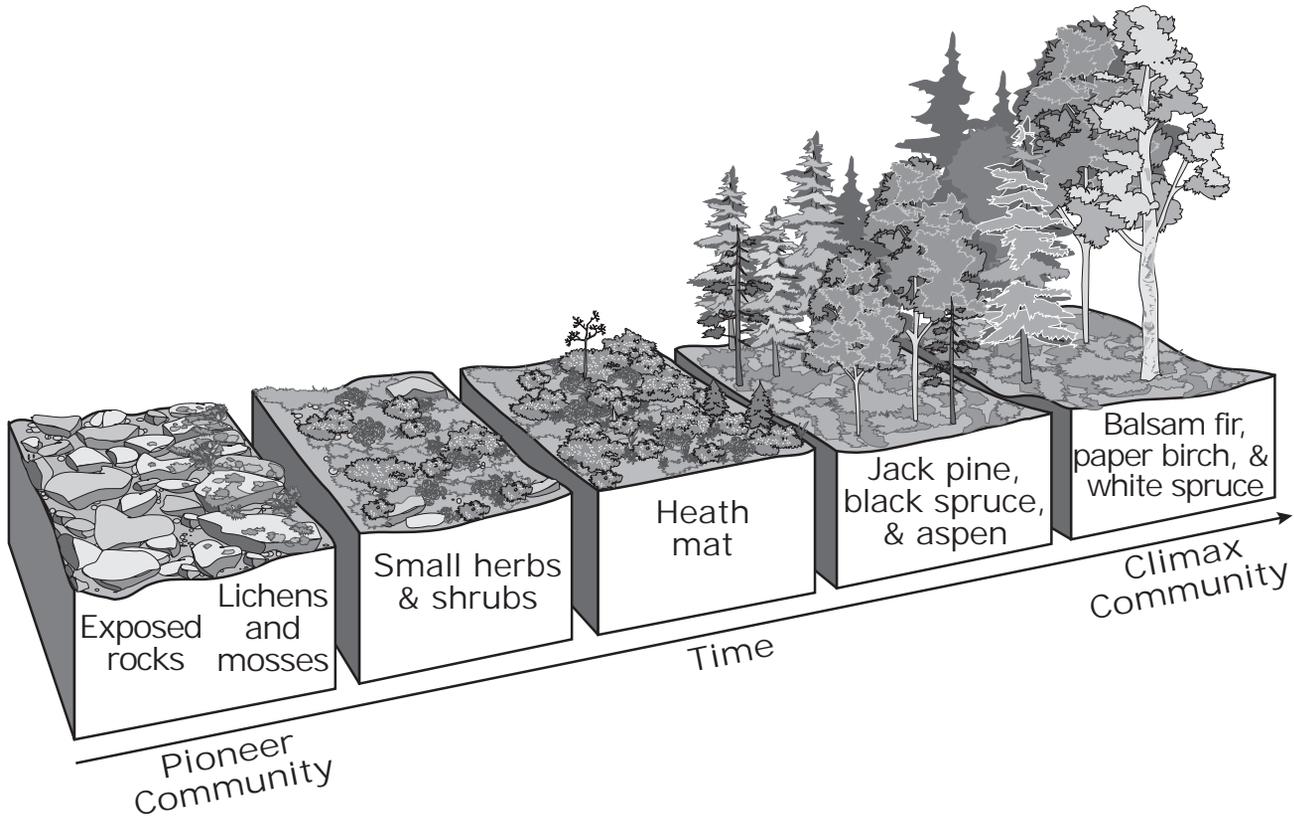
- 1.** Add radioactively labeled nitrogen to the jar.
- 2.** Place the potted pea plant in the bell jar with a valve and seal it.
- 3.** Measure the amount of radioactive nitrogen in the plant tissues.
- 4.** Leave the jar in the sunlight for three days.

In what order should he perform these steps?

- F** 1 - 4 - 2 - 3 - 4
G 3 - 2 - 1 - 4 - 3
H 1 - 2 - 3 - 4 - 3
J 3 - 4 - 3 - 2 - 1

Section 1

- 5 The following diagram illustrates the process of a forest maturing into a climax community.



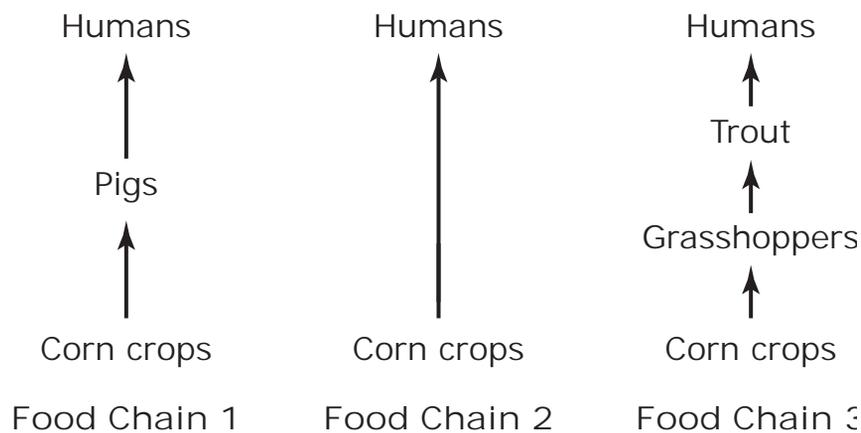
What general conclusions could an ecologist make when contrasting pioneer with climax communities?

- A The biomass and biodiversity increase over time.
- B The biomass and biodiversity decrease over time.
- C The biomass increases over time while the biodiversity remains constant.
- D The biomass increases over time while the biodiversity decreases.

6 Pipefish and sea horses, members of the Syngnathidae family, reproduce similarly. The female's eggs are placed into a pouch located on the male's abdomen and remain there until they hatch. The presence of this abdominal pouch can be used to construct which of these?

- F** a pedigree showing genetic inheritance
- G** a table listing genotypes of offspring
- H** a key using structural characteristics to identify organisms
- J** a pyramid showing energy flow in an ecosystem

7 Look at the energy pathways in the food chains shown below.



In which food chain would humans receive the least amount of energy supplied by the producer?

- A** Food Chain 1
- B** Food Chain 2
- C** Food Chain 3
- D** all food chains are equal

Section 1

- 8 A student plans to perform an investigation about protozoa with this experimental procedure.

Experiment Procedure

1. Collect water samples from several ponds near the school.
2. Put drops of the water samples on glass slides to observe under a microscope.
3. Observe and count the number of protozoa in each water sample.

Which group of symbols best indicates the safety precautions for this investigation?

F



G



H

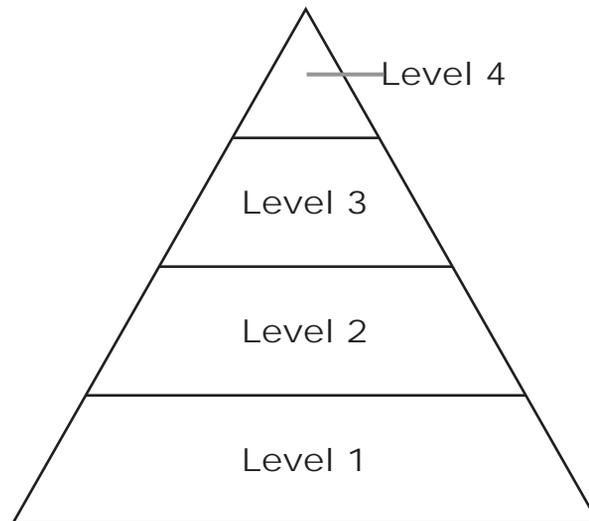


J



9

Energy Pyramid
of an Ecosystem



The amount of energy produced by the plants in this ecosystem increased by 10,000 joules.

How many of the additional 10,000 joules will most likely reach the pyramid level containing the top carnivores?

- A 10 joules
- B 100 joules
- C 1,000 joules
- D 10,000 joules

Section 1

10 A scientist observed a young toad was stung on the tongue while trying to eat a bee. She hypothesized that if the toad saw a similar insect, then it would not try to eat the insect. To test her hypothesis, she observed the toad's behavior when she presented it with two insects. One insect was a robber fly, which resembled a bee, and the other was a dragonfly, which did not.

The scientist concluded that the toad's behavioral response improved its chances of survival. Based on this information, which statement best describes the results of the scientist's experiment?

- F** The scientist rejected her hypothesis because the toad ate the dragonfly but not the robber fly.
- G** The scientist rejected her hypothesis because the toad ate the robber fly but not the dragonfly.
- H** The scientist accepted her hypothesis because the toad ate the dragonfly but not the robber fly.
- J** The scientist accepted her hypothesis because the toad ate the robber fly but not the dragonfly.

11

The Roles of Organisms in an Aquatic Ecosystem

Organism	Role	Trophic Level
Algae	Producer	Primary
Daphnia	Herbivore	Secondary
Osprey	Carnivore	Quaternary
Minnow	Omnivore	Tertiary
Largemouth bass	Carnivore	Quaternary

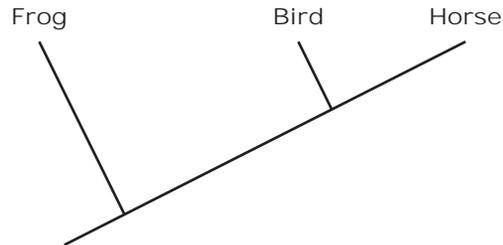
Based on the table, which organisms are in direct competition in the aquatic ecosystem?

- A minnow and osprey
- B daphnia and minnow
- C largemouth bass and osprey
- D largemouth bass and minnow

12 Which action is the most important to complete before beginning an experiment?

- F Keep a careful record of all observations.
- G Gather the necessary safety equipment.
- H Clean the workspace.
- J Read all directions.

- 14** The cladogram shows the relationships among frogs, birds, and horses. The table shows some characteristics of these organisms.



Organism	External Covering	Skeleton	Fertilization	Common Ecological Niche
Frog	Moist, soft skin	Four-limbed vertebrate	External	Wetlands
Bird	Feathers	Four-limbed vertebrate	Internal	Trees
Horse	Fur	Four-limbed vertebrate	Internal	Plains

The cladogram is based on which properties from the table?

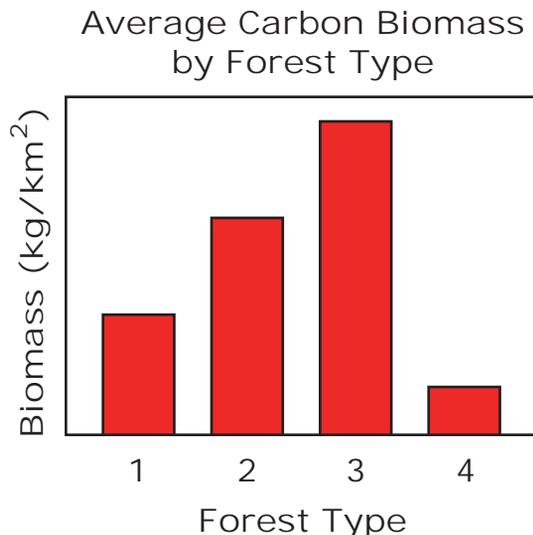
- F** fertilization and ecological niche
- G** ecological niche and external covering
- H** homologous skeletal structures and fertilization
- J** external covering and analogous skeletal structures

Section 1

15 Which tool should a scientist use to measure a yeast metabolic waste product?

- A a balance to measure the mass of sugar
- B a balance to measure the mass of carbon dioxide
- C a graduated cylinder to measure the volume of sugar
- D a graduated cylinder to measure the volume of carbon dioxide

16 Some researchers investigated the amount of carbon per square kilometer in some forest types. The graph shows the results of the investigation.



Which hypothesis do these results best support?

- F If a forest is a Type 1 forest, then the forest uses less carbon during photosynthesis than the forest releases during respiration.
- G If a forest is a Type 2 forest, then the forest releases carbon dioxide faster than forests of other types release carbon dioxide.
- H If a forest is a Type 4 forest, then the forest removes more carbon from the carbon cycle than a Type 3 forest.
- J If a forest is a Type 3 forest, then the forest will absorb more carbon than a Type 1 forest.

17 Which component should a scientist measure to determine the rate of respiration in an onion root tip?

- A** the oxygen, in milliliters per minute, the root tip uses
- B** the glucose, in millimeters per root cell, the root tip uses
- C** the oxygen, in milliliters per minute, the root tip releases
- D** the water, in millimeters per root cell, the root tip releases

18 An oak leaf and a pine needle are differently shaped plant structures but are classified together because

- F** both perform the same functions and are homologous.
- G** each performs different functions and is homologous.
- H** both perform the same functions and are analogous.
- J** each performs different functions and is analogous.



STOP

END OF SECTION 1

